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THE SUSCEPTIBILITY TO PLAGUE OF THE PRAIRIE DOG, THE DESERT WOOD RAT, AND THE ROCK SQUIRREL.*

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THE animals (other than controls) used in this experiment were trapped upon the U.S. Marine Hospital Reservation at Fort Stanton, New Mexico. After they had been kept in captivity for several weeks an effort was made to determine the susceptibility of the several species to infection with the plague bacillus.

The culture of *B. pestis* used was one that had been isolated from the spleen of a naturally infected ground squirrel about two months prior to the present experiments. The third generation on agar was used, the culture having been grown for 72 hours at 37° C.

In the case of the animals in which the culture was inoculated subcutaneously, one loopful of the agar culture was suspended in 100 c.c. of salt solution (0.8 per cent), and a volume of the suspension sufficient to contain the dose shown in the table injected beneath the skin of the belly. When the cutaneous method of inoculation was practiced, a loopful of undiluted agar culture was rubbed into the shaven skin of the belly.

The dose used subcutaneously was large enough in each case to infect a susceptible animal with certainty, but was not large enough to make it necessary to take the question of plague intoxication into account. The question of intoxication does not need to be considered in the cutaneous inoculations.

For the purpose of controlling the dose and the virulence of the culture, we have used, as will be seen from an examination of the table, a guinea-pig and three black rats (*Mus rattus*). It will be seen by a glance at the table that the rats died in about the usual time that one expects a plague-infected rat to die.

The guinea-pig sickened promptly, developed a large brawny reaction at the site of inoculation, and showed marked enlargement

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of the inguinal lymphatic glands. The symptoms abated, however, and the animal recovered, showing no lesions of plague when it was chloroformed on the twenty-fifth day after inoculation. Other guinea-pigs inoculated from the same culture have succumbed to plague in the usual time and, so far as we are able to judge, the failure of the culture to kill this particular rodent was due to the presence of a considerable degree of natural immunity. Natural immunity of guinea-pigs to plague while rarely encountered is recognized by nearly all who have studied the relations of these rodents to plague infection.

The following table gives all of the data in regard to each animal:

Animal	Weight Grams	Dose of Culture	Day of Death	Lesions	Remarks
Rock squirrel.....	...	0.01 loop	4	Acute plague	
Rock squirrel.....	320	0.005 "	4	" "	
Rock squirrel.....	385	0.001 "	5	" "	
Rock squirrel.....	600	"Vaccinated"*	3	" "	
Rock squirrel.....	560	" "	5	" "	
Wood rat.....	170	0.01 loop	3	" "	
Prairie dog.....	1,100	" "	6	" "	
Guinea-pig.....	400	" "	Killed 25th day	None	Control, animal sickened but recovered, probably naturally immune
Black rat.....	135	" "	4	Acute plague	Control
Black rat.....	60	0.001 "	4	" "	"
Black rat.....	?	"Vaccinated"*	4	" "	"

* Cutaneous inoculation.

A culture of *B. pestis* was isolated from the heart blood or from the liver or spleen of all the animals that died.

The statement in the column headed "lesions" should be qualified by the explanation that as the wood rat and the prairie dog were the only members of these species we have ever seen infected with plague there was no standard with which to make a comparison but the lesions were similar to those seen in other rodents that have died of acute plague.

In regard to the nature of the lesions, we may say that they presented no points of special interest with the possible exception of the fact that careful search failed to show any evidence of a bubo in the prairie dog. The wood rat presented changes similar to those seen in ordinary rats artificially infected. In the rock squirrels the findings were identical with those seen in naturally and artificially infected ground squirrels (*Citellus beecheyi*).

It might perhaps have been assumed in advance that all of these animals would prove susceptible to plague infection, in view of the fact that closely related species are known to be very susceptible to the infection.

The results of the work may be summarized as follows:

The rock squirrels are quite readily infected, probably being equally as susceptible as the ground squirrel (*Citellus beecheyi*).

As but one prairie dog and one desert wood rat were available it would be unsafe to go farther than to assert that the specimens tested exhibited no evidence of immunity to plague; on the other hand, judging by this one experiment they appear to be quite susceptible to the infection.

The scientific and common names of the rodents mentioned, their place in the natural order to which they belong, their relation to one another and to species that are known to contract plague in nature are shown here:†

Order, *Glires*

Family, *Scuridae*

Subfamily, *Scuirinae*

Genus, *Citellus*

Species, *Citellus grammurus*, Say (Rock squirrel)

(N.I.) Species, *Citellus beecheyi*, Richardson (California ground squirrel)

Subfamily, *Marmotinae*

Genus, *Cynomys*

Species, *Cynomys ludovicianus arizonensis*, Mearns (Arizona prairie dog)

Family, *Muridae*

Subfamily, *Neotominae*

Genus, *Neotoma*

Species, *Neotoma albigula angusticeps*, Merriam (Eastern desert wood rat)

(N.I.) Species, *Neotoma fuscipes*, Baird (Dusky footed wood rat)

Subfamily, *Murinae*

Genus, *Mus*

(N.I.) Species, *Mus rattus*, Linnaeus (Black rat)

(N.I.) Species, *Mus norvegicus*, Erxleben (Brown rat)

(N.I.) Species, *Mus musculus*, Linnaeus (House mouse)

Family, *Caviidae*

(N.I.) *Cavia cobaya*, Pallas (Guinea-pig)

The mammals found infected in nature are indicated by N.I.

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